Welcome to my resume GitHub Repository
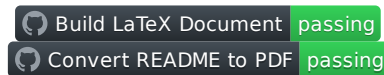
[Download latest resume (PDF)](#) [needs to be updated but it is pretty recent]

[Download PDF version of this README](#)

Below is my comprehensive resume in `.md` format

JAMES MICHAEL ROSADO
Email: jarosado0911@gmail.com

SUMMARY

Experienced applied research mathematician with over 10 years of research, programming experience, software architecture, software testing, and highly proficient in solving technical problems. Experienced with version control via Git, Github, and Gitlab. Well versed in utilizing numerical methods for solving discretized partial differential equations. Experienced writing code in C/C++, MatLab, Mathematica, and Python for generating computational domains, solving large matrix problems using numerical algorithms, and training/testing ML models.

EDUCATION

- Sep. 2017 – June 2022 Doctor of Philosophy (Ph.D.) in Mathematics, Temple University, Philadelphia, PA
- Sep. 2012 – June 2016 Master of Arts (M.A.) in Mathematics, Rowan University, Glassboro, NJ
- Sep. 2008 – Sep. 2009 Teacher of Mathematics Certificate, NJ Department of Education, Trenton, NJ
- Sep. 2003 – June 2007 Bachelor of Science (B.S.) in Electrical and Computer Engineering, Rutgers University, New Brunswick, NJ
- Sep. 1999 – June 2003 High School Diploma, Pitman High School, Pitman, NJ

SUMMARY

- Holds Top Secret/SCI clearance since 2021
- Applied Research Mathematician with over 10 years of experience
- Projects range from pure theoretic mathematics to designing software used in computational neuroscience research and classrooms
- Experienced with various systems which include: MacOS, Linux: RedHat and CentOS, Windows
- Programming experience: C/C++, Shell, MatLab, Mathematica, Java, LUA, C#, Unity, Python
- Experienced using Python based AI/ML modules: Scikit-learn, word2vec, TensorFlow, PyTorch
- Experienced using C/C++ based parallelization libraries: MPI and OpenMP
- Experienced using common development technologies: Git, GitHub, GitLab, Atlassian Bitbucket
- Experience using numerical methods for solving discretized partial differential equations

WORK EXPERIENCE

Sep. 2022 to Present U.S. Government/ Department of Defense/ National Security Agency
Maryland, USA

- Applied Research Mathematician conducting research and actively coding implementations across different branches of the agency.

- Actively publishes work within the agency with viewership covering several divisions of the DoD.

- Holds TS/SCI clearance. Jan. 2024 - Aug. 2024 National Security Agency, Operations Software Engineer,
  Maryland, USA

- Updated code and followed the code review process when implementing programming structures.

- Implemented a code class for optimizing code execution.

- Performed efficiency analysis between different coding structures.

- Discovered structures which efficiently utilize HPC memory and cpu resources.

- Code was released for IC use and for expediting mission outcomes.

- Received Monetary Award for contributing to improved software performance at the agency. Sep. 2023 - Jan. 2024 National Security Agency, Engagement and Policy
  Maryland, USA

- Implemented article recommendation systems via known ML algorithms using Python modules.

- Implementations include TF-IDF methodologies and Neural Network via word2vec

- Proactively collaborated with several agency organizations to promote the usage of article recommendation software

- Software aids in rapid onboarding of new hire to the agency

- Utilized data science techniques to generate data for agency offices on the usage of articles recommended by the recommendation software

- Presented work at an internal agency conference to members from different IC divisions.

- Conveyed ML article recommendation pipeline to agency technical experts.

- Authored internal technical paper on articles recommendation systems.

- Given a performance coin award for work completed on ML based recommendation systems.

June 2023 – Aug. 2023 Institute for Defense Analyses (IDA) Summer Conference in Applied Mathematics Problems, Princeton NJ

- Collaborated with IDA and DoD employees to implement software for processing audio data

- Parallelized code for efficient processing of multiple audio files and large audio files

- Implemented statistical methods and Bispectrum analysis for audio change point detection.

- Presented work to technical audience and director other collaborators on the usage of the software

- Authored internal article on audio change detection.

Oct. 2022 – May 2023 National Security Agency, Mathematics Research
Maryland, USA

- Developed advanced understanding of bash and shell scripting

- Implemented publicly known graph-based query algorithms, which include nearest neighbor descent and distributed hierarchical navigable small world networks.

- Worked with developers of graph-based query software at Lawrence Livermore National Lab (LLNL).
- Developed templated code for general usage within query based software
- Utilized high performance computing services to test code and validate results
- Time off award for software engineering performance for advanced coding practices
- Monetary award for software engineering performance involving advanced query-based algorithms.

Summer 2021 NSA Graduate Mathematics Program Summer Internship
Maryland, USA

- Collaborated with a team of fellow graduate interns and NSA/DoD employees.
- Implemented and measured accuracy of Neural Networks and binary classifiers designed to detect/classify authentic and synthesized speech.
- Developed algorithms to detect synthesized speech using Bispectrum Analysis and Topological Data Analysis.
- Received Top Secret Sensitive Compartmented Information clearance.
- Co-authored an internal technical paper with results of our research.
- Conveyed highly technical results to an executive audience.
- Prepared briefing on results for the Director of the National Security Agency.

Sep. 2019 – Sep. 2022 Researcher at the Center for Computational Mathematics & Modeling (C2M2)
Temple University, Philadelphia, PA

- Developed efficient immersed virtual reality (VR) environment with real-time interaction of biological neurons in small neuronal networks (Neuro-VISOR), Virtual Interactive Simulation of Reality
- Implemented sparse numerical solvers for efficient solving of PDE based Hodgkin-Huxley formalism for neuron electrical signal propagation.
- Implemented neuron synapse equations for real-time interaction of small neuronal networks.
- Implemented parallelism by process threading for efficient numerical solving of small networks of neurons.
- Utilized known programming practices in C# and Unity3D VR environment for efficient code implementation.
- Currently used in neuroscience classroom settings to demonstrate the behavior of small neuronal networks.
- Currently used in neuronal simulation of small neuronal networks to predict behavior of electrical propagation.
- Implemented mesh generation software (Python) for the generation of VR neuronal mesh via parallel transport of neuron geometry contours.
- Collaborated with students, researchers, and professors at Temple University.
- Coordinated efforts on project objectives and led weekly team meetings.
- Maintained project on GitHub.

Sep. 2018 – Sep. 2022 Researcher in the Queisser Research Group
Temple University, Philadelphia, PA

- Co-developed software to model the effects of neuron intracellular calcium dynamics in the presence of electric fields induced by transcranial magnetic stimulation (TMS).

- Developed a pipeline for executing ultrastructural numerical simulations on neuron spine-to-dendrite calcium dynamics utilizing uG4 (unstructured grid 4) software framework.
- Developed a pipeline using domain decomposition methods, finite volume/element implementations coupled with massive parallelism via message passing interface (MPI).
- Utilized HPC resources at Temple University for the execution of numerical simulations.
- Awarded 3 years in a row NSF HPC compute time via the XSEDE (Extreme Science and Engineering Discovery Environment) consortium and utilized San Diego Supercomputer (SDSC) HPC services EXPANSE and COMET
- 2022 DMS200031, "Ultrastructural Calcium Simulations in Neurons", 500,000 Core-hours (EXPANSE)
- 2021 DMS200031, "Ultrastructural Calcium Simulations in Neurons", 500,700 Core-hours (EXPANSE)
- 2020 DMS200031, "Ultrastructural Calcium Simulations in Neurons", 800,000 Service units (COMET)
- Collaborated with researchers at the University Minnesota, Temple University, and University of Freiburg, Germany.
- Mentored students on computational neuroscience projects and coordinated with undergraduates the project objectives and led project meetings.
- Maintained project on GitHub.
- Awarded funding by NIH to attend Brain Initiative summer school at the University of Missouri.

Sep. 2017 – June 2022 Graduate Teaching Assistant
Temple University, Philadelphia, PA

- Instructed and graded mathematics courses
- Proctored examinations
- Mentored students on computational neuroscience projects, mentoring through graduate talks, SIAM talks/events, and undergraduate math club talks.
- Designed curriculum, syllabi, midterm examinations and quizzes
- Set up course websites using Blackboard and Canvas
- Collaborated with professors to improve and implement effective instruction practices.
- Piloted graduate student teaching experience
- Attended coordinated course meetings and provided feedback
- Volunteered as mathematics tutor for Calculus courses and algebra courses at Math Consulting Center (MCC)

Sep. 2012 – June 2016 Mathematics Researcher
Rowan University, Glassboro, NJ

- Developed an algorithm to partition mathematical structures (from linear algebra) called Finite Frames.
- Partition algorithm implemented in Mathematica.
- Developed a methodology for evaluating non-trivial definite integrals via complex analysis techniques.
- Attended conferences to present work at University Symposia to attract more students to the Rowan University research group.
- Algorithms were published in academic journals.
- Work presented at the Joint Mathematics Meeting (JMM).

Sep. 2016 – June 2017 Adjunct Professor
Rowan University, Glassboro, NJ

- Adjunct Professor of instruction for evening Calculus I courses.
- Designed lectures, lecture notes, and interactive lessons.
- Designed/Graded assessments which include examinations, quizzes, and daily assessments.
- Provided abundant office hours before and after class.
- Provided ample review sessions for examinations.
- Provided frequent student feedback via email communications and website communications.
- Maintained and updated Canvas website on a daily basis.
- Utilized announcement features on Canvas to provide course updates.

Sep. 2009 – June 2017 High School Mathematics Teacher
Clearview Regional School District, Mullica Hill, NJ

- Certified mathematics teacher for 9th – 12th grade.
- Designed lessons to be interactive and student oriented.
- Designed and implemented NJ Core Content Standards into lessons.
- Attended district professional development events include NJEA teacher conventions.
- Attended workshops on implementing "Accountable Talk" in the classroom.
- Attended workshops on incorporating technology into the classroom, such as TI-84 calculators and Geometer's Sketchpad software.
- Collaborated with colleagues to design coordinated examinations.
- Provided night school instruction and homebound instruction.
- Co-taught courses with special education teachers to meet student needs.
- Designed lessons to fulfill IEP and 504 accommodations.
- Provided after school hours for tutoring and extra help.
- Participated in extracurricular activities: Mr. Clearview, track/field timer, dance chaperoning, and event security.
- Actively communicated to parents via phone calls, emails, and website messaging.
- Tracked student progress via PowerSchool and PowerTeacher.
- Regularly participated in student recognition through National Honor Society awards, college letter of recommendations, and selection of students of the month.
- Mentored Rowan University education majors by providing feedback, observations, practice lessons, and experiential learning in an active High School setting. Sep. 2011 – June 2016 Private Tutor Gloucester County, NJ
- Provided one-on-one tutoring and instruction to local county students.
- Coordinated scheduling with parents.
- Provided hands-on lessons and practice.
- Discussed with parents their child's progress.
- Utilized manipulatives to teach grade school topics through high school grade topics.
- Provided mentoring on career goals and potential fields of study.

PUBLICATIONS

- Rosado, James Michael (2022). Doctoral Dissertation: "Ultrastructural Neuronal Modeling of Calcium Dynamics under Transcranial Magnetic Stimulation." Temple University Libraries.
- Rosado, James Michael (2016). Master's Thesis: "Partitions of Finite Frames." ProQuest Theses and Dissertations, Rowan University, Glassboro, NJ.
- Rosado J. M., Borole P.R., Neal M., and Queisser G. (2023). "Neuronal Resilience and Calcium Signaling Pathways in the Context of Synapse Loss and Calcium Leaks: A computational and modeling study and implications for Alzheimer's Disease." In SIAM Journal on Applied Mathematics (Vol. 83, Issue 6, pp. 2418-2442). Society for Industrial & Applied Mathematics (SIAM).
- Rosado J. M., Shirinpour S., Hananeia N., Tran H., Galanis C., Vlachos A., Jedlicka P., Queisser G., and Opitz A. (2021) "Multiscale modeling toolbox for single neuron and subcellular activity under Transcranial Magnetic Stimulation." In Brain Stimulation (Vol. 14, Issue 6, pp. 1470-1482). Elsevier BV.
- Rosado J. M., Bui V. D., Haas C. A., Beck J., Queisser G., Vlachos A., "Calcium modeling of spine apparatus-containing human dendritic spines demonstrates an 'all-or-nothing' communication switch between the spine head and dendrite." PLOS Computational Biology, April 2022.
- Rosado J. M., Nguyen H. D., and Cao L., "Partitions of Equiangular Tight Frames," Linear Algebra and its Applications. Vol. 526, pp. 95-120, March 2017.
- Rosado J. M., and Osler T., "A table of definite integrals from the marriage of power and Fourier series," Scientia, Vol. 26, pp. 77-82, August 2015.

DEVELOPED SOFTWARE

- 2018 – 2022, C2M2, Temple University, Neuro-VISOR (Virtual Interactive Simulation of Reality), applications in computational neuroscience, real-time simulation of neuron electrical dynamics in a VR environment, https://github.com/c2m2/Neuro-VISOR
- 2018 – 2019, OpitzLab, University of MinnesotaNeuron Modeling for TMS (NeMo-TMS), a toolbox for multi-scale modeling of the effects of Transcranial Magnetic Stimulation on single-neurons, https://github.com/OpitzLab/NeMo-TMS
- 2021 – 2023, Queisser Group, Temple University, CalcSim, MatLab simulation code for modeling intracellular calcium dynamics of single neurons, https://github.com/NeuroBox3D/CalcSim
- 2022 to Present, Queisser Group, Temple University, PythonNeuronMesh, software for generating surface meshes from 1D models of neurons, https://github.com/jarosado0911/PythonNeuronMeshes

UNDERGRADUATE RESEARCH

Summer 2005 Undergraduate Engineering Research
College of Engineering, Rowan University, Glassboro, NJ

- Designed transistor-based replica of leech heart interneuron.
- Used the Hodgkin-Huxley based formulas as a basis for transistor array design.
- Investigated the application of Mentor Graphics FPGA (Field Programmable Gate Array) Advantage software to teach and for experimentation.

June 2000 – June 2003 Undergraduate Research
College of Humanities and Social Sciences, Rowan University, Glassboro, NJ

- Conducted archaeological conservation at the Archaeology Museum of La Serena, Chile.
- Designed a computer program to determine human stature based on measurements of archaeological remains, using statistical paradigms.

- Participated in the mapping of an archaeological site.

June 2004 Undergraduate Research (abroad)
Universidad Catolica Del Norte, Coquimbo, Chile

- Analyzed and translated ChemCAD software to develop cultivation systems for the growth of shellfish.
- Learned about the farming process of shellfish.

AWARDS

DoD/NSA Awards

- 2025 Monetary Award for contributing to improved software performance at the agency.
- 2024 Monetary Award for software engineering performance on developing and implementing article recommendation software.
- 2024 Performance Coin Award: Work completed on ML based recommendation systems.
- 2023 Time Off Award: Software Engineering Performance for advanced coding practices.
- 2023 Monetary Award: Software Engineering Performance involving advanced query based algorithms.

National Science Foundation HPC Awards

- 2022 XSEDE Compute Research Award: $2,440 award
- 2021 XSEDE Compute Research Award: $2,440 award
- 2020 XSEDE Compute Research Award: $12,873 award

Temple University Awards

- Mar. 2022 Dissertation Completion Grant: $8,750 award
- May 2020 First Summer Research Initiative Award: $6,000 award
- May 2022 Jay Novik Graduate Student Fellowship: $5,000 award for exceptional Performance in the Graduate Mathematics Program
- Summer 2019 NIH Brain Initiative Summer School Funding Award
- Jan. 2019 Mathematics Department Excellence in Teaching Award: $500 award
- Nov. 2018 SIAM Recognition: Leadership and coordination of SIAM Chapter activities

Rowan University Awards

- 2015 – 2016 Certificate of Achievement in Mathematics for JMM participation and publishing.
- 2014 – 2015 Certificate of Achievement in Mathematics for JMM participation.

Rutgers University Awards

- 2003 – 2007 Edward J. Bloustein Distinguished Scholar

PRESENTATIONS

- June 2022, J. Rosado, "Ultrastructural Neuronal Modeling of Calcium Dynamics Under Transcranial Magnetic Stimulation." Doctoral Defense, Temple University, Philadelphia, PA.
- Oct. 2021, J. Rosado, "Neuron Dendritic Spines: Modeling Calcium Communication." Temple University College of Science and Technology Research Mixer, Temple University Philadelphia, PA.

- May 2021, J. Rosado, "Hodgkin-Huxley Conductance Based Model: From 1D to 3D." Temple University Numerical PDEs Course, Temple University, Philadelphia, PA.
- Jan. 2021, J. Rosado, "Applied Mathematics: Modeling Neuronal Electrical and Ion Dynamics." Temple University, Philadelphia, PA.
- Dec. 2020, J. Rosado, "PDE Based Image Reconstruction." Temple University Numerical PDEs Course, Temple University, Philadelphia, PA.
- Nov. 2020, J. Rosado, "Modeling an Action Potential and Neuronal Behavior." Temple University Graduate Seminar, Temple University, Philadelphia, PA.
- Jan. 2020, J. Rosado, "An Investigation of Spine to Dendrite Calcium Communication." Temple University Applied Mathematics Seminar, Temple University, Philadelphia, PA.
- Oct. 2019, J. Rosado, "Inner Workings of a Neuron: A Mathematical Perspective." Temple University Math Club, Temple University, Philadelphia, PA.
- May 2019, J. Rosado, "A Walkthrough Calculus of Variations." Temple University Methods in Applied Mathematics Course, Temple University, Philadelphia, PA.
- Dec. 2018, J. Rosado, "Sturm-Liouville Theory: An Example." Temple University Methods in Applied Mathematics Course, Temple University, Philadelphia, PA.
- March 2018, J. Rosado and T. Osler, "A table of definite integrals from the marriage of power and Fourier series." At EPaDel Spring Section Meeting, Philadelphia, PA.
- Fall 2017, J. Rosado, "Partitions of Equiangular Tight Frames." Temple University Graduate Student Seminar, Temple University, Philadelphia, PA.
- Jan. 2017, J. Rosado, H. Nguyen, and L. Cao, "Partitions of Equiangular Tight Frames." At Joint Mathematics Meeting, Atlanta, GE.
- May 2016, J. Rosado, H. Nguyen, and L. Cao, "Partitions of Equiangular Tight Frames." At Rowan University STEM Symposium, Glassboro, NJ.
- April 2016, J. Rosado, "Frame Partitioning Algorithms." Master's Thesis Presentation, Rowan University Mathematics Department, Glassboro, NJ.
- May 2015, J. Rosado and T. Osler, "A table of definite integrals from the marriage of power and Fourier series." At Rowan University STEM Symposium, Glassboro, NJ.
- Aug. 2015, J. Rosado and T. Osler, "A table of definite integrals from the marriage of power and Fourier series." At MAA Mathfest, Washington D.C.
- May 2015, J. Rosado and T. Osler, "A table of definite integrals from the marriage of power and Fourier series." At Sigma Xi Research Symposium, St. Joseph's University, Philadelphia, PA.
- Jan. 2015, J. Rosado and T. Osler, "A table of definite integrals from the marriage of power and Fourier series." At Joint Mathematics Meeting, San Antonio, TX.

SKILLS

- Microsoft Office: MS Word, MS PowerPoint, MS Excel
- Software: LaTex, MatLab, Mathematica, Sage, Maple, C/C++, Python, LUA, JAVA, C#, Unity3D
- Collaboration Tools: Skype and Zoom
- Software Development: Git, GitHub, GitLab, Atlassian Bitbucket
- LaTex: Design of Syllabi, academic articles, lecture notes, beamer presentations, posters
- Geometer's Sketchpad, TI-84 Graphing Calculator
- Maintaining websites through Canvas, Blackboard, and Google Classroom

- Utilizing PowerSchool and PowerTeacher to track student progress
- Strong communication skills via email, phone calls, in person meetings, and group meetings
- Designing interactive lessons and modifying lessons "on-the-go"
- Designing curriculum, lessons, and assessments to reflect 21st century skills
- Utilizing interactive white boards

PROFESSIONAL AFFILIATIONS

- Sep. 2018 – June 2022, Temple University SIAM Chapter President
- Sep. 2018 – June 2022, Temple University SIAM Chapter Member
- Sep. 2018 – June 2022, SIAM Member and journal subscriber
- Sep. 2017 – June 2022, American Mathematical Society (AMS)
- Sep. 2017 – June 2022, Mathematical Association of America (MAA)
- Sep. 2015 – June 2017, Rowan University Pi Mu Epsilon Chapter Member
- Sep. 2015 – June 2017, Pi Mu Epsilon Member
- Sep. 2008 – June 2017, New Jersey Education Association (NJEA) Member
- Sep. 2008 – June 2017, Clearview Regional Education Association Union Member
- Sep. 2006 – Sep. 2008, IEEE member and journal subscriber

LANGUAGES

- English: Native Language
- Spanish: Conversational and written

HOBBIES

- Reading books: neuroscience, mathematics, sci-fi, history poetry, biographical, philosophy, high fantasy
- Writing mathematical articles, writing poetry, drawing and painting
- Personal fitness, running, weightlifting, hiking,
- Attending baseball games (Orioles and Phillies) and football games (Ravens and Eagles)
- Video games and board games
- Restaurant hopping, breweries, wineries, traveling the continental US, and traveling abroad